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PAPERS

IN

MECHANICS.

N° I.

TAP FOR CUTTING HOLLOW SCREWS.

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The SILVER VULCAN MEDAL *and* FIVE GUINEAS *were this Session presented to Mr.* SIEBE, 406, *Strand, for his* TAP FOR CUTTING HOLLOW SCREWS. *A Model of his Apparatus has been placed in the Society's Repository.*

SCREWS vary from each other, not only in magnitude, but in the direction and complication of their threads; hence there are right and left-handed screws, also single, double, and treble screws. The apparatus of Mr. Siebe enables the workman, with the same tool, to form either right or left, single, double, or treble, hollow screws of the same diameter. The screws capable of being made by this implement are very

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far from being mathematically accurate, but will be found to be quite as good as the hollow screws made in the usual way, and adapted to the purposes of various wooden articles of domestic furniture, and to the commoner kinds of machinery.

The tap is a thin, quadrilateral piece of steel of the length and breadth of the required screw, having its longitudinal edges cut into saw teeth, the teeth in one row being opposite to the intervals in the other, and, therefore, representing the section of a screw, the teeth being sections of the threads. A cylinder of hard wood is turned so as to correspond with the dimensions of the intended screw, and a longitudinal piece having been cut out from the middle, representing a section through the axis; the serrated plate of steel is to be inserted and firmly riveted into its place. The cylinder terminates in a flat head, for the purpose of receiving a key, or lever, in order to overcome the friction experienced in cutting the screw.

In order to use this tool, a cylindrical hole, equal in diameter to the cylindrical stem, is to be bored in a piece of wood, and the serrated cylinder being then introduced, giving to it a circular or spiral motion, will form a right or left-handed screw, according to the direction in which it is turned; and, by entering two or three threads at once, by means of a very simple cutter, fig. 5, the same tap will give a double or treble-threaded screw.

Reference to the Figures of Mr. SIEBE'S *Universal Screw Tap—Plate VI.*

Fig. 1, the tap for wooden screws; it is composed of a cylinder of hard wood, *a a*, sawn down the middle, as fig. 2, and of a steel blade, *b b*, fixed in by two or more rivets, *c c*. The hard wood being first made into a screw the blade is riveted in, and the teeth are filed to fit the wooden threads; the blade is then removed, the threads are just turned off, leaving the stem cylindrical; the blade is then tapered at the point, so that the first teeth are no bigger than the cylinder, as fig. 3, and is again riveted in its place. Fig. 4, is an end view; the cylinder is cut away a little at *d d*, to make room for the shavings: as the cylinder fits the hole and the blade is taper, it secures a gradual and steady cut, which may be either to the right or left hand.

Fig. 5 is a V tool (*e* is a section of its cutting edge) to begin the thread in order to get the proper lead, it is most needful in the double or treble threads.

Fig. 6 shows a treble-threaded hole; a cut is made at 1 and then a cut is made at 2, which shall slope under 1, leaving one thread; then a cut is made at 3 to slope under 2, which, if continued, would leave two threads under 1, and three threads under 3, giving the lead for a treble thread.

Fig. 7 shows a steel tap for metal screws.

Fig. 8 is an end view, showing how it is filed away to leave the threads on each side, like teeth, quite sharp; it is first tapped like a plain screw, with the threads at *f* turned off; it is then filed square, and the threads (or teeth as they may now be called) at two opposite angles are filed away, to coincide with the plain part at *f*; these taps cut better, the nearer the plain part fills the hole. Above fig. 6 is shown a hole in the screw plate with two sloping notches, which do not pass the bottom thread.